

Appl. No. : 09/921,641
Filed : August 3, 2001

REMARKS

In the outstanding Office Action, the Examiner has rejected Claims 1-5 and 7-15, and objected to Claim 6. Claim 12 has been amended, and no new matter has been added. Reconsideration and allowance of all Claims 1-15 in light of the present remarks is respectfully requested.

Rejections Under 35 U.S.C. § 103(a)

The Examiner has rejected Claims 1-5 and 7-15 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,320,969 to Killion in view of U.S. Patent No. 3,924,159 to Hoover.

To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, and the prior art references, when combined, must teach or suggest all the claim limitations. M.P.E.P. § 2143. If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 U.S.P.Q. 1125 (Fed. Cir. 1984).

The circuit of Claim 1 comprises “a battery supplying a battery output voltage; a voltage sensor having an output dependent on said battery output voltage; an audio amplifier; a cutoff circuit connected to substantially disable said audio amplifier in response to said voltage sensor output; and a crowbar circuit connected to load said battery with a circuit element in response to said voltage sensor output.”

Neither Killion nor Hoover teaches or suggests a circuit connected to disable an amplifier and a circuit connected to load a battery “in response to [a] voltage sensor output”, wherein the voltage sensor output is “dependent on [a] battery output voltage” as recited in Claim 1. In contrast, Killion describes a low battery alarm circuit for a hearing aid. In response to detection of a low battery voltage, the alarm circuit activates an audible alarm heard privately by the hearing aid wearer. The alarm is only audible if the amplifier is enabled.

Hoover teaches activation of a crowbar circuit 9 and disabling an amplifier 3 in response to an output signal from a differential voltage detector. The output of the differential voltage detector is dependent upon the output voltage of the amplifier 3, not a battery output voltage.

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Furthermore, neither Hoover nor Killion provide any suggestion or motivation to modify the hearing aid described by Killion with the teachings of Hoover. On the contrary, the suggested modification would make Killion's hearing aid unsatisfactory for its intended purpose, where the intended purpose of Killion's hearing aid alarm circuit is to notify a user of a low battery condition by providing an audible warning signal. Killion's alarm circuit 20 creates an AC output signal which is provided to the amplifier circuit 14, where the amplifier circuit 14 receiving the AC output signal is coupled to a receiver providing an audible warning signal to the user indicating low battery voltage. *Col. 5, lines 32-35, 64-67; Fig. 1, Fig. 2.* Thus, the alarm is not audible if the audio amplifier is disabled. In the event the audio amplifier of Killion's hearing aid was disabled according to the teachings of Hoover, the alarm would not be audible to the hearing aid wearer. Thus, as the suggested modification would make Killion's hearing aid unsatisfactory for its intended purpose, there is no suggestion or motivation to make the modification suggested by the Examiner.

In regard to Claims 1-2, 7, 8, 10, and 12-14, the Examiner stated that "Killion teaches a hearing aid which comprises an audio amplifier (14), a microphone (13), a speaker (15), a battery (11) and a method for detecting low battery output voltage (figures 1, 1A and 3)." The Examiner further stated that the method taught by Killion "comprises sensing a low battery voltage (21, 21A, 31) and substantially disabling the audio amplifier (see col. 6, lines 4-15, figure 3 and see the on-off switch 12 for the manual shut off of the alarm)." However, the Examiner further stated that "Killion does not teach that the circuit or method for substantially disabling the audio amplifier and loading the battery in response to low battery output voltage."

Applicant best understands the Examiner's statements with regard to Killion as recognizing that Killion's hearing aid includes an on-off switch 12 which provides a means for disconnecting the battery from the amplifier circuit, but Killion does not teach a circuit for substantially disabling the audio amplifier and a circuit for loading the battery in response to a battery output voltage. Thus, Killion does not teach or suggest all of the elements as recited in Claim 1. In fact, as described above, Killion would not provide such a circuit because it would disable the very alarm Killion seeks to produce.

The Examiner also stated that "Hoover teaches an amplifier protecting system which comprises a cut off circuit or a method for sensing a low battery voltage (7, col. 3, lines 30-50 and col. 4, lines 4-24), wherein the voltage sensor (7) monitors the dropping voltage (ground

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fault) and substantially disabling the amplifier (col. 4, lines 13-14) and loading the battery (the crowbar circuit 9) in response to low battery output voltage (also see col. 3, lines 41-50).” The Examiner thus argued that “[s]ince Killion and Hoover teaches the circuit for disabling the amplifier in response to the voltage sensor output; it therefore would have been obvious to one skilled in the art to provide the method for sensing a low battery voltage, substantially disabling the audio amplifier and load the battery in response to the low battery output voltage, or provide the cutoff circuit and the crowbar circuit, as taught by Hoover, in the Killion device for better protecting the audio amplifier system.” Applicant respectfully disagrees.

Hoover describes an amplifier protection circuit configured to remove a drive signal and bias voltage from the amplifier circuit 3 being protected in response to a fault, such as a short circuit, across a load driven by the amplifier. *Abstract; Figure*. The protection circuit comprises an emulating amplifier 1 substantially identical to the amplifier 3 being protected, a current sensing resistor 5, and a current sensor or differential amplifier 7. The protection circuit further includes a crowbar circuit 9 for removing bias voltages from the driver stage 11 of the amplifier 3, and for removing drive signals and bias voltages from the output stage of the amplifier 3 in response to an output signal from the differential amplifier 7. *Col. 1, lines 37-47*. In the event of a ground fault at the output terminal 32 of the amplifier 3, the differential amplifier 7 detects a voltage differential across the sensing resistor 5 and the amplifier 3 is disabled via operation of the crowbar circuit. *Col. 3, line 30 – col. 4, line 14*.

However, in contrast to the circuit of Claim 1, Hoover’s protection circuit does not disable the amplifier and load a battery in response to a low battery voltage. In fact, in the event the voltage supplied to the operating voltage terminal 23 were to go low, the crowbar circuit 9 would not be triggered and the amplifier 3 would not be disabled. Thus, Hoover fails to describe some of the same elements of Claim 1 that are missing from Killion.

Thus, as the prior art of record fails to teach or suggest every element as set forth in Claim 1, nor is there any suggestion or motivation to combine or modify reference teachings to arrive at the claimed invention, Applicant respectfully submits that Claim 1 is in condition for allowance.

The arguments with respect to Claim 1 similarly apply to Claims 7 and 12, and therefore, Applicant respectfully submits that Claims 7 and 12 are in condition for allowance. Claim 12

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has been amended to recite that the disabling occurs "automatically" to clarify that the step does not cover removing the battery or turning the hearing aid off manually.

Because Claims 2-5, 8-11, and 13-15 depend from Claims 1, 7, and 12, pursuant to 35 U.S.C. § 112, ¶ 4, they incorporate by reference all the limitations of the claim to which they refer. It is therefore submitted that these claims are in condition for allowance at least for the reasons expressed with respect to the independent claim, and for their other features.

Conclusion

Applicant has endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. Accordingly, arguments in support of the patentability of the pending claim set are presented above. In light of these remarks, reconsideration and withdrawal of the outstanding rejections is respectfully requested.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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